FIG. 1

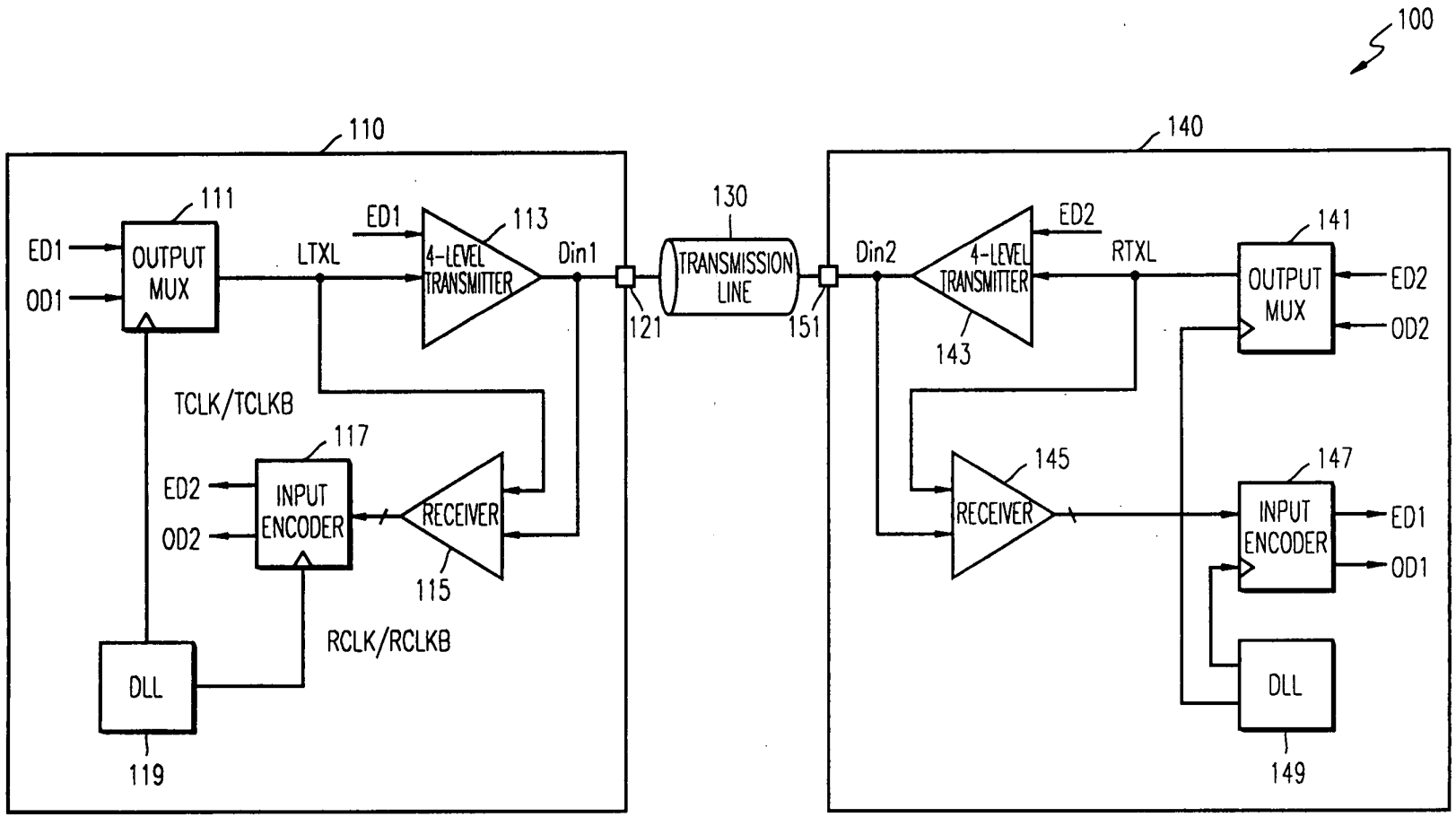

100
110
111
ED1
OD1
OUTPUT MUX
LTXL
ED1
113
4-LEVEL TRANSMITTER
Din1
121
130
TRANSMISSION LINE
151
140
Din2
ED2
4-LEVEL TRANSMITTER
143
RTXL
141
OUTPUT MUX
ED2
OD2
TCLK/TCLKB
117
ED2
OD2
INPUT ENCODER
RECEIVER
115
145
RECEIVER
147
INPUT ENCODER
ED1
OD1
RCLK/RCLKB
DLL
119
DLL
149

FIG. 2

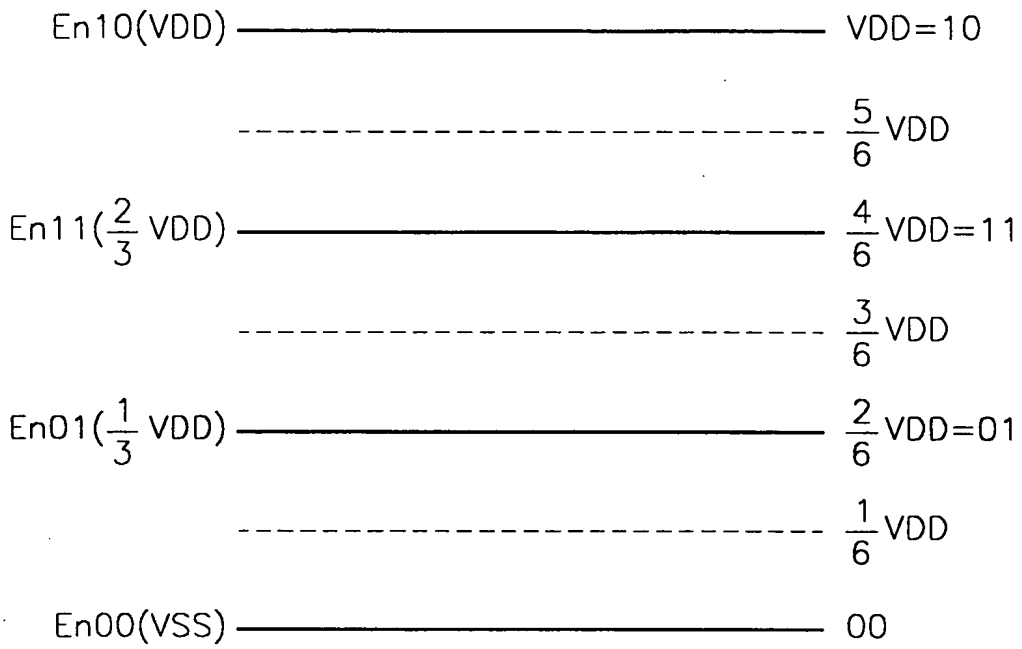


FIG. 3

LTXL \ RTXL	En10	En11	En01	En00
En10	10(VDD)	$\frac{5}{6}$VDD	11($\frac{4}{6}$VDD)	$\frac{3}{6}$VDD
En11	$\frac{5}{6}$VDD	11($\frac{4}{6}$VDD)	$\frac{3}{6}$VDD	01($\frac{2}{6}$VDD)
En01	11($\frac{4}{6}$VDD)	11($\frac{3}{6}$VDD)	01($\frac{2}{6}$VDD)	$\frac{1}{6}$VDD
En00	$\frac{3}{6}$VDD	01($\frac{2}{6}$VDD)	$\frac{1}{6}$VDD	00(VSS)

FIG. 4

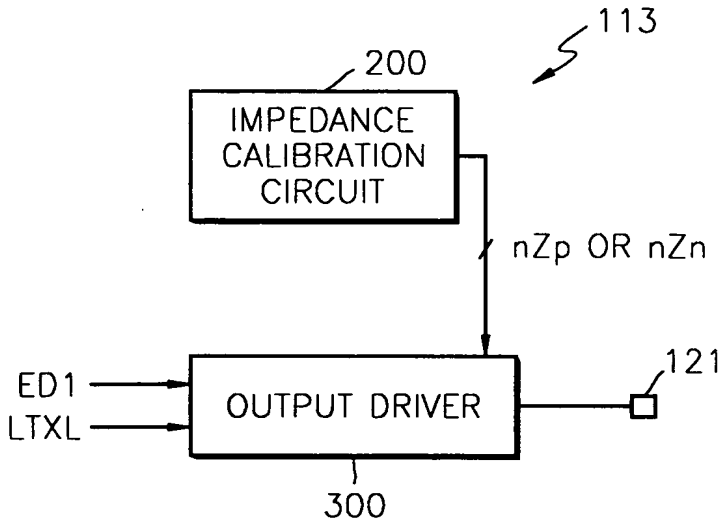

113
200
IMPEDANCE CALIBRATION CIRCUIT
nZp OR nZn
ED1
LTXL
OUTPUT DRIVER
121
300

FIG. 5

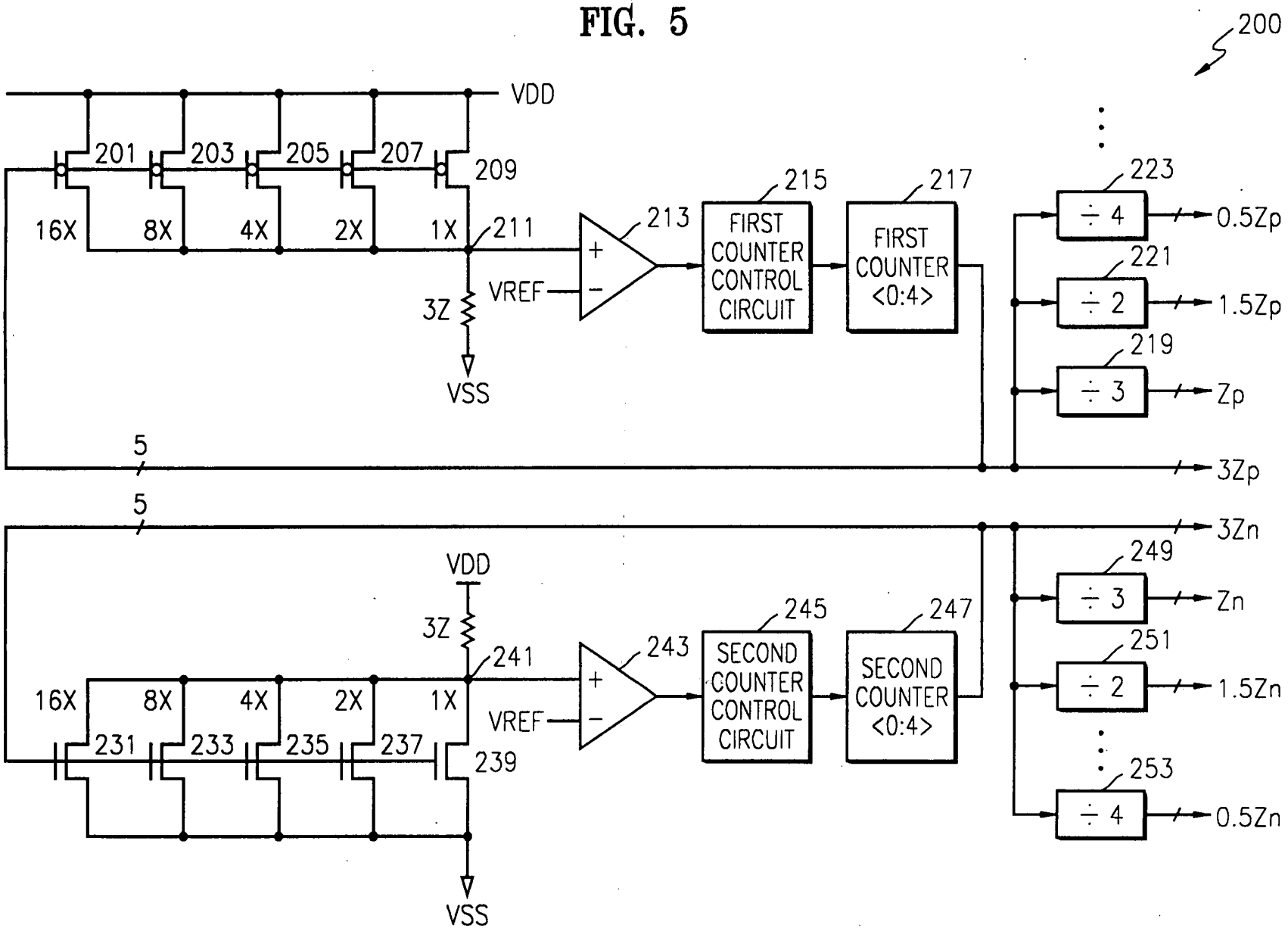

200
VDD
201
203
205
207
209
16X
8X
4X
2X
1X
211
213
215
FIRST COUNTER CONTROL CIRCUIT
217
FIRST COUNTER <0:4>
223
÷ 4
0.5Zp
221
÷ 2
1.5Zp
219
÷ 3
Zp
3Zp
5
5
3Zn
249
÷ 3
Zn
251
÷ 2
1.5Zn
253
÷ 4
0.5Zn
VDD
3Z
241
243
245
SECOND COUNTER CONTROL CIRCUIT
247
SECOND COUNTER <0:4>
16X
8X
4X
2X
1X
231
233
235
237
239
VREF
VSS
VREF
3Z
VSS

FIG. 6

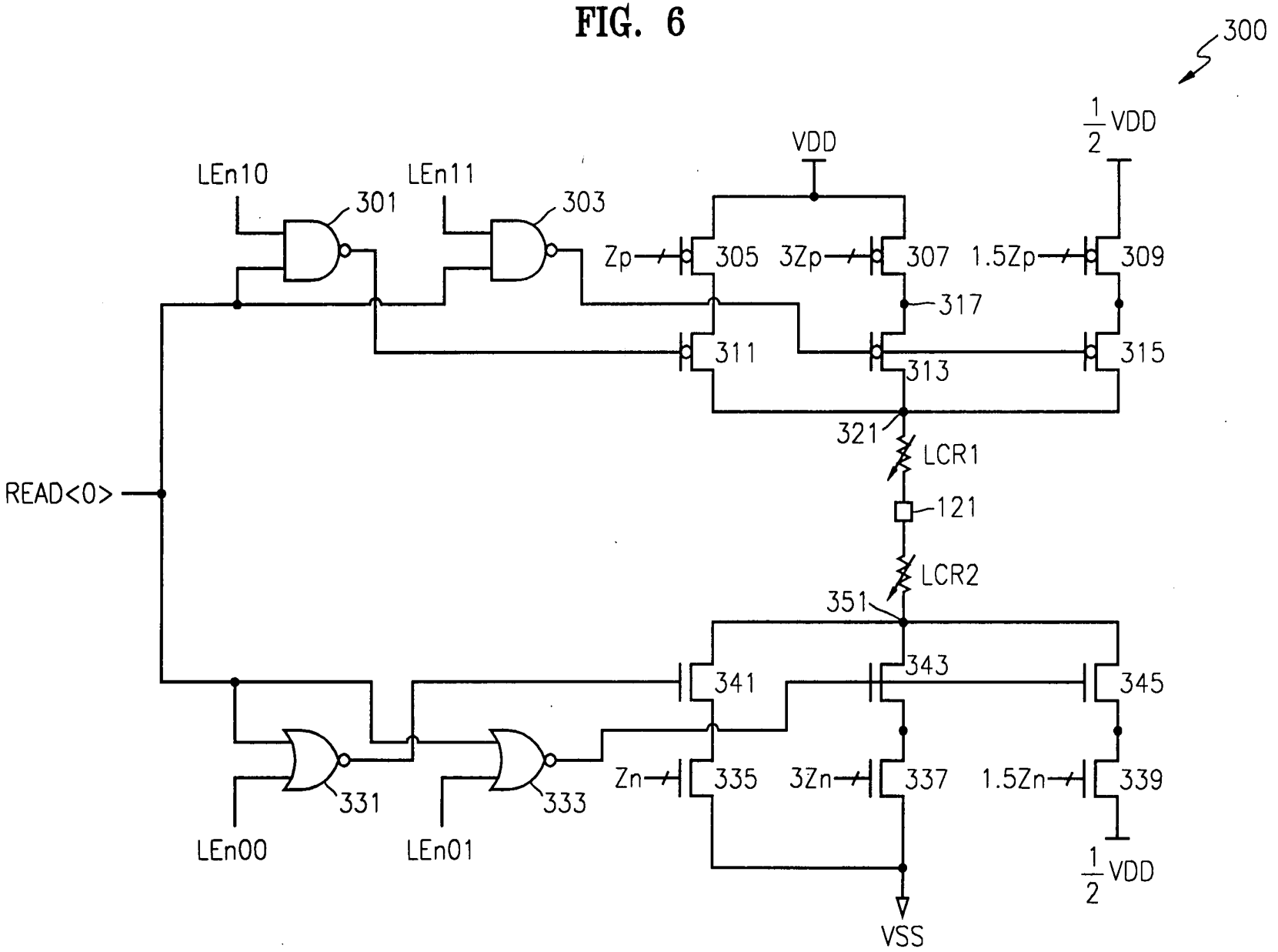

300
LEn10
LEn11
301
303
VDD
1/2 VDD
Zp
305
3Zp
307
1.5Zp
309
317
311
313
315
321
LCR1
READ<0>
121
LCR2
351
341
343
345
331
333
Zn
335
3Zn
337
1.5Zn
339
LEn00
LEn01
1/2 VDD
VSS

FIG. 7

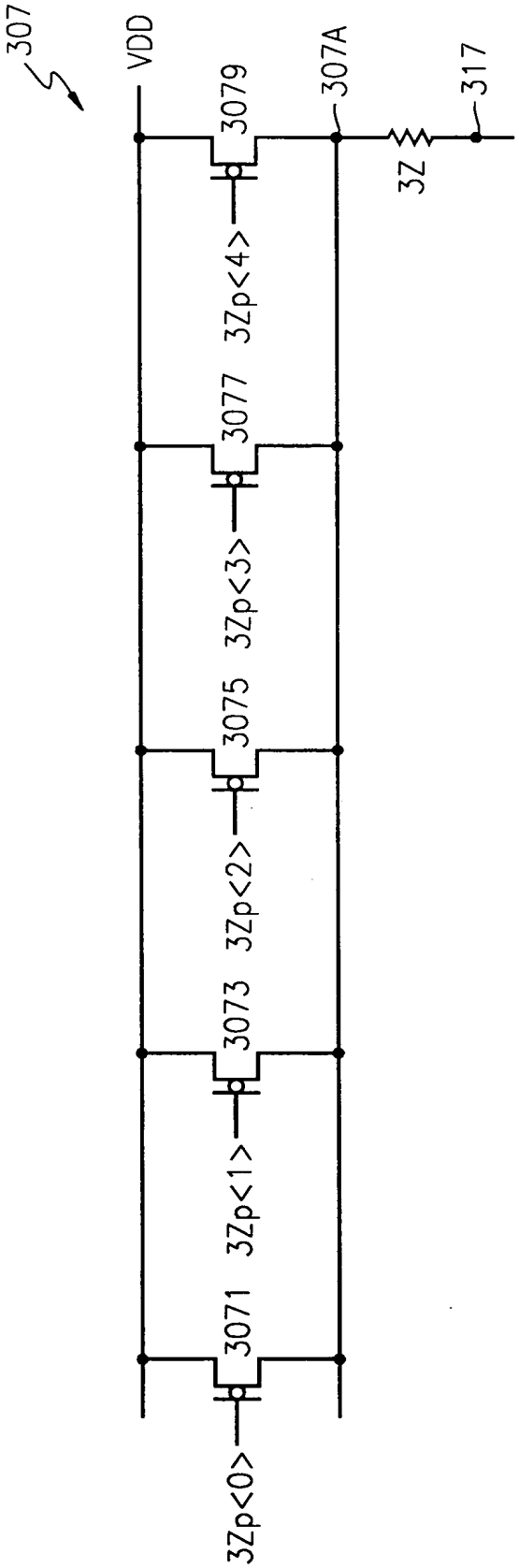

307
VDD
3079
307A
317
3Z
3Zp<4>
3077
3Zp<3>
3075
3Zp<2>
3073
3Zp<1>
3071
3Zp<0>

FIG. 8

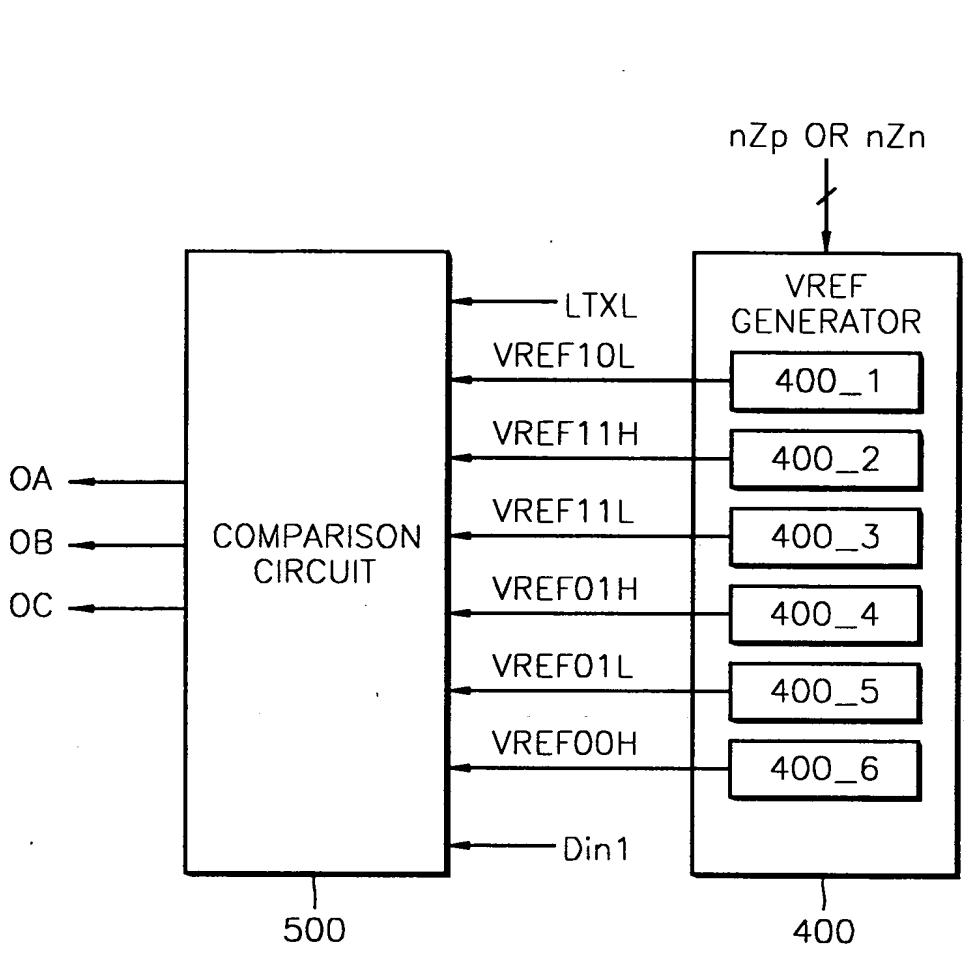

115
nZp OR nZn
VREF GENERATOR
400_1
400_2
400_3
400_4
400_5
400_6
LTXL
VREF10L
VREF11H
VREF11L
VREF01H
VREF01L
VREF00H
Din1
OA
OB
OC
COMPARISON CIRCUIT
500
400

FIG. 9

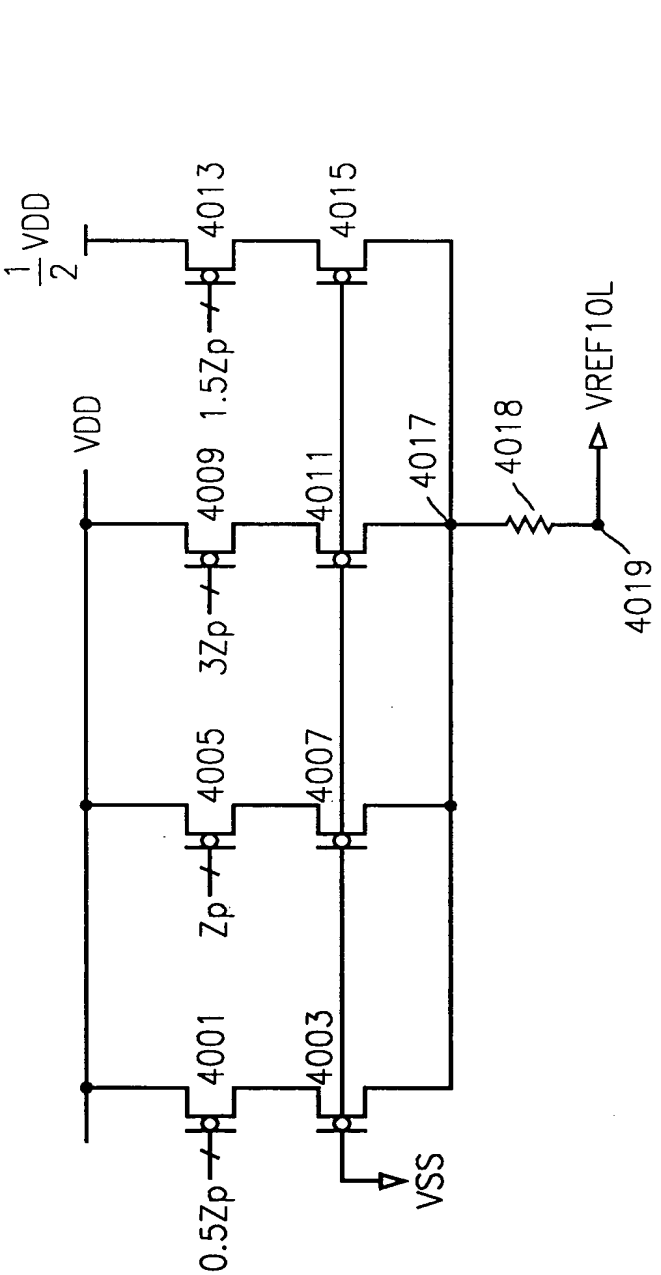

400_1
1/2 VDD
4013
4015
VDD
1.5Zp
4009
4011
4017
4018
VREF10L
3Zp
4005
4007
4019
Zp
4001
4003
0.5Zp
VSS

FIG. 10

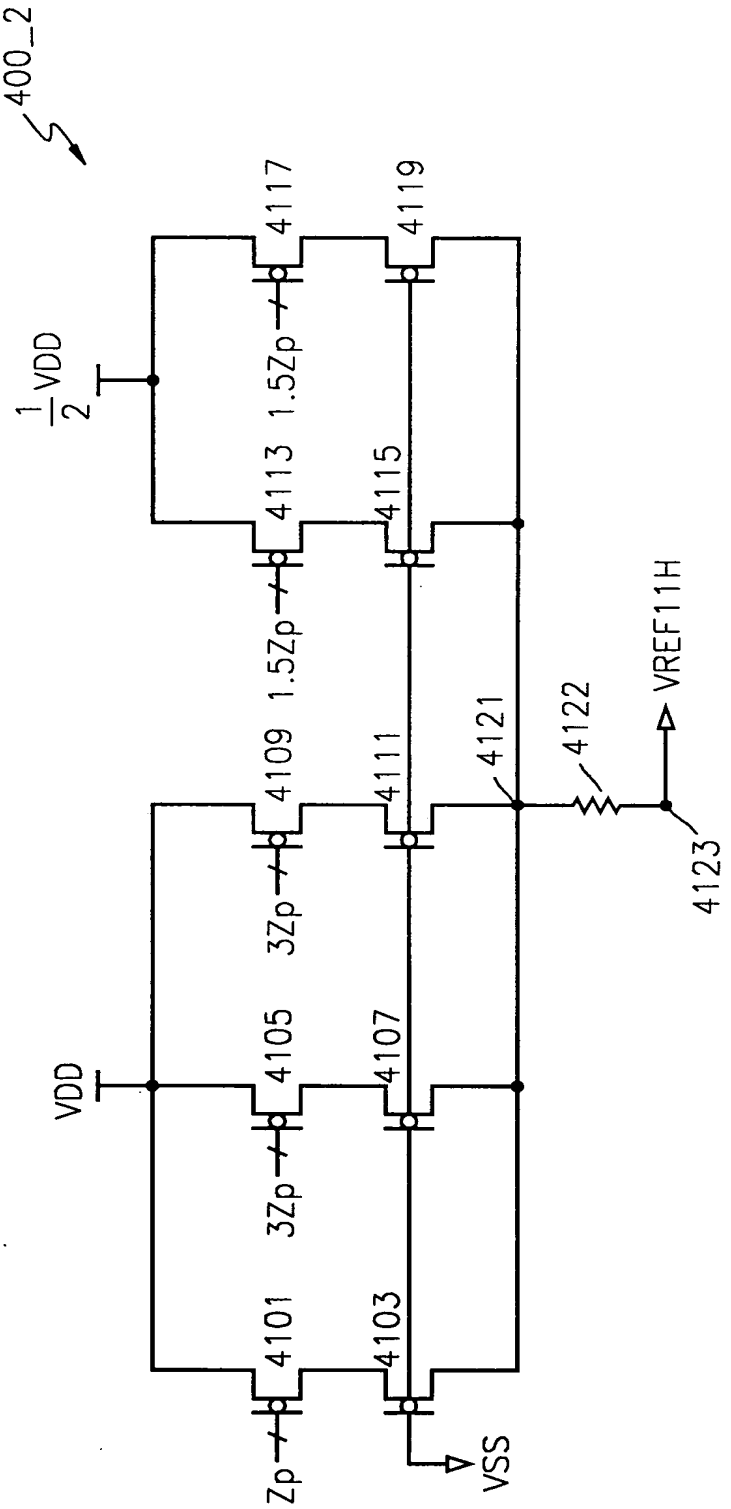

400_2
1/2 VDD
VDD
4101
4103
4105
4107
4109
4111
4113
4115
4117
4119
4121
4122
4123
Zp
3Zp
3Zp
1.5Zp
1.5Zp
VSS
VREF11H

FIG. 11

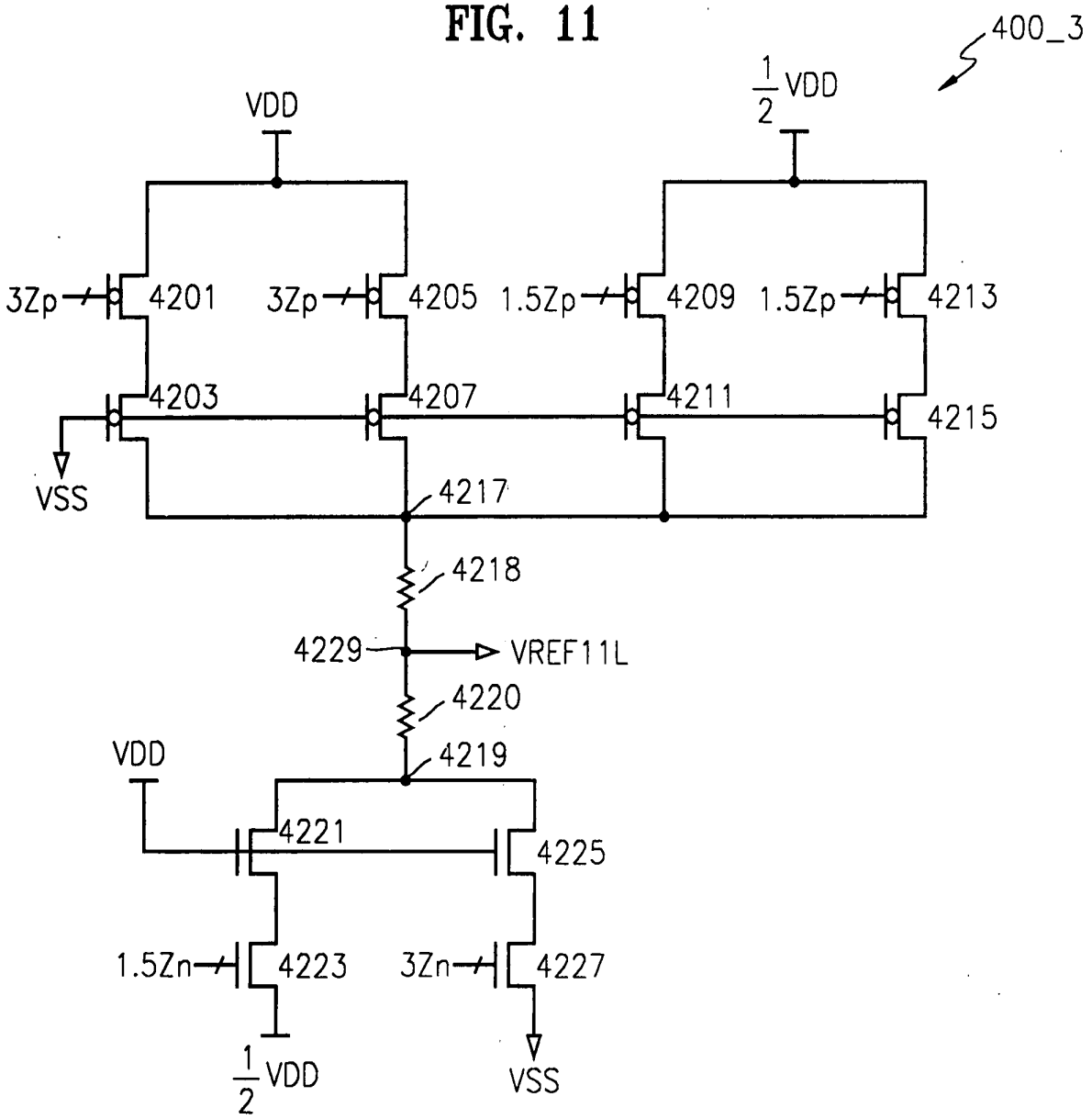

400_3
VDD
1/2 VDD
3Zp
4201
3Zp
4205
1.5Zp
4209
1.5Zp
4213
4203
4207
4211
4215
VSS
4217
4218
4229
VREF11L
4220
VDD
4219
4221
4225
1.5Zn
4223
3Zn
4227
1/2 VDD
VSS

FIG. 12

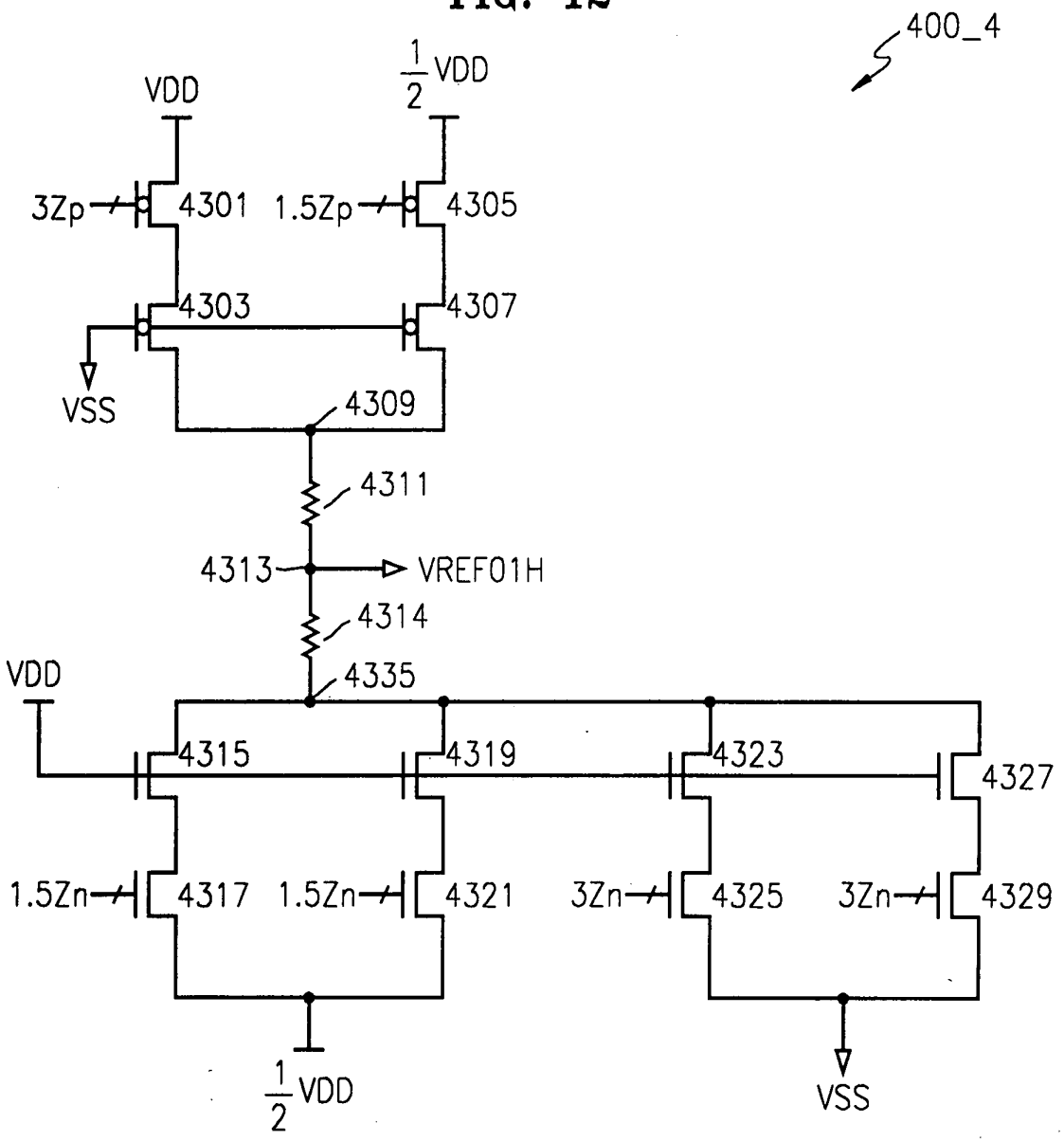

400_4
VDD
1/2 VDD
3Zp
4301
1.5Zp
4305
4303
4307
VSS
4309
4311
4313
VREF01H
4314
4335
VDD
4315
4319
4323
4327
1.5Zn
4317
1.5Zn
4321
3Zn
4325
3Zn
4329
1/2 VDD
VSS

FIG. 13

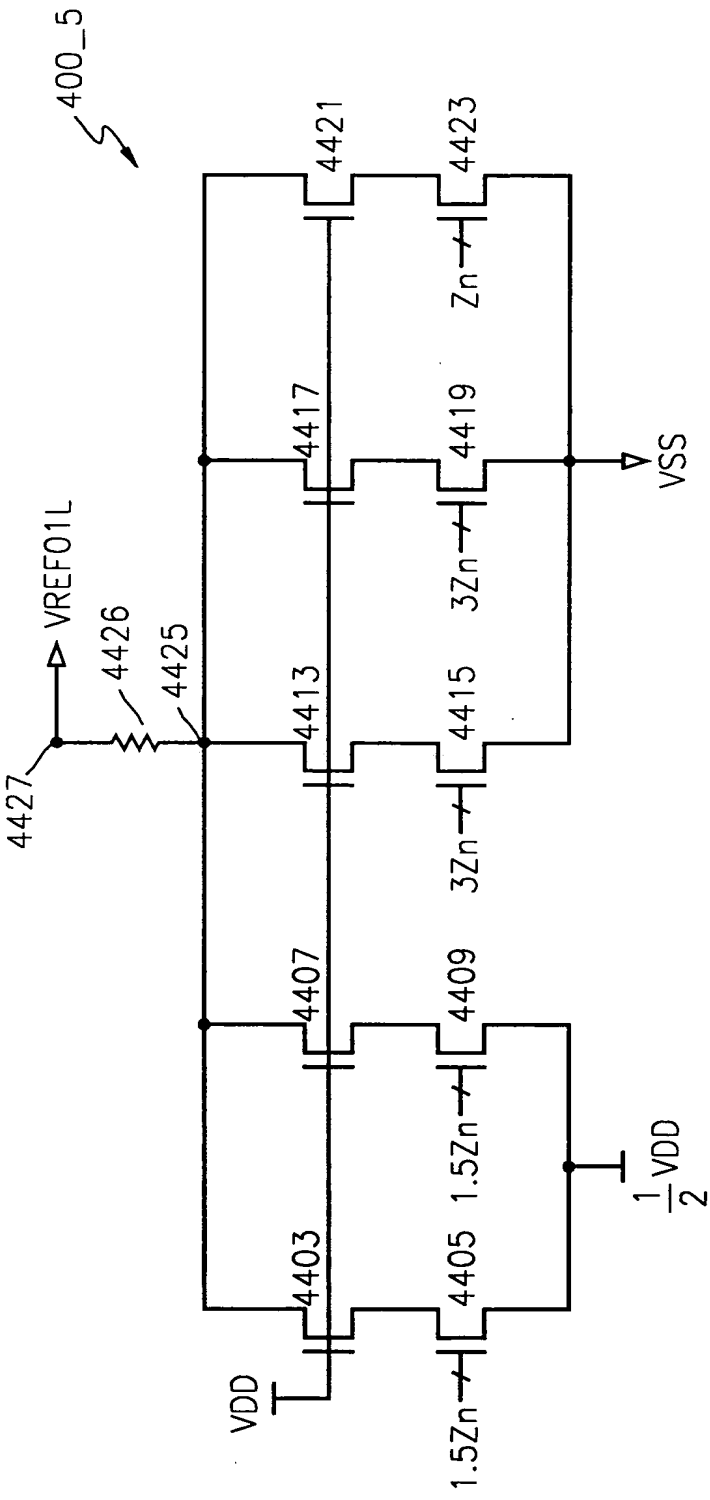

400_5
4421
4423
Zn
4417
4419
VSS
VREF01L
4426
4425
3Zn
4413
4415
4427
3Zn
4407
4409
1.5Zn
1/2 VDD
4403
4405
VDD
1.5Zn

FIG. 14

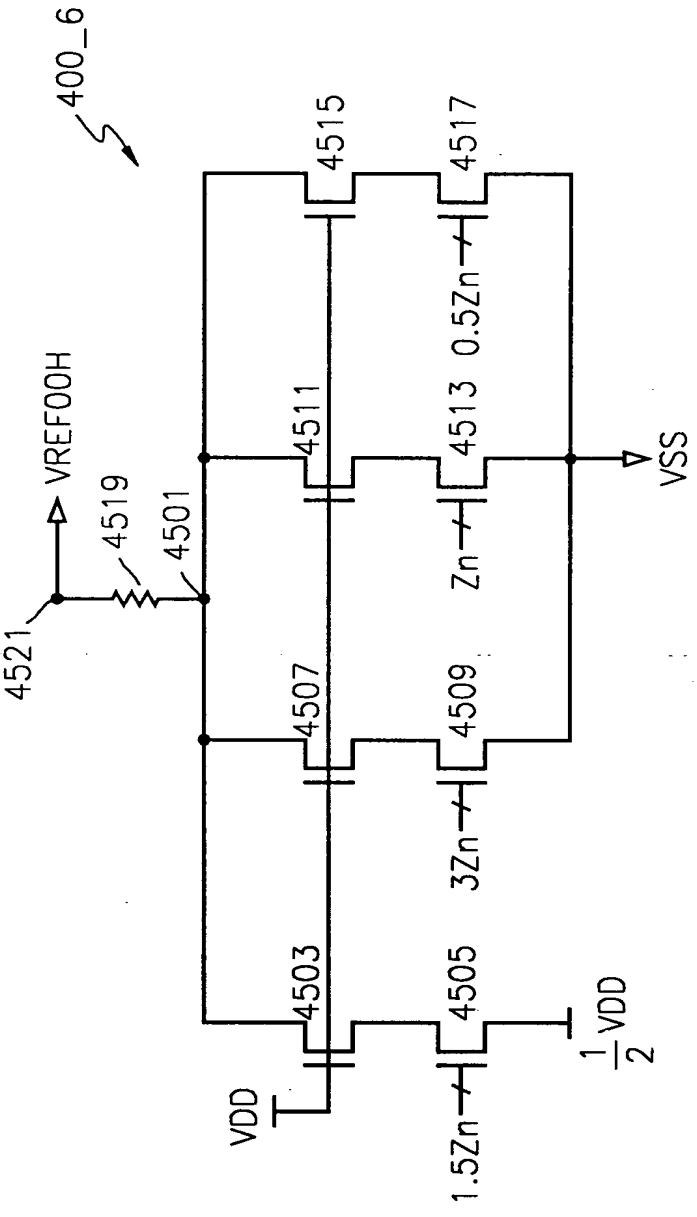
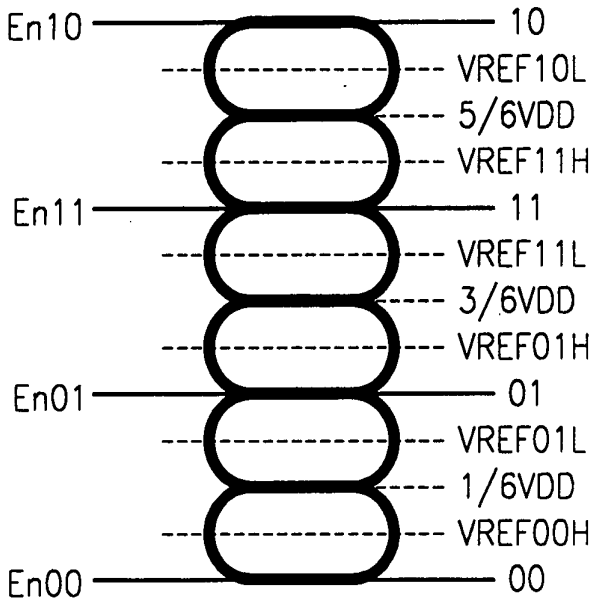

400_6
4515
4517
VREFOOH
4519
4501
4511
4513
0.5Zn
VSS
4521
Zn
4507
4509
3Zn
4503
4505
VDD
1.5Zn
1/2 VDD

FIG. 15



VOLTAGE	CONDITIONS
10	10◄►10
VREF10L	10//(10◄►11)
5/6VDD	10◄►11
VREF11H	(10◄►11)//{11v(10◄►01)}
11	(11◄►11)v(10◄►01)
VREF11L	{11v(10◄►01)}//{(11◄►01)v(10◄►00)}
3/6VDD	(11◄►01)v(10◄►00)
VREF01H	{(11◄►01)v(10◄►00)}//{01v(11◄►00)}
01	(01◄►01)v(11◄►00)
VREF01L	{01v(11◄►00)}//(01◄►00)
1/6VDD	01◄►00
VREF00H	(01◄►00)//00
00	00◄►00

FIG. 16

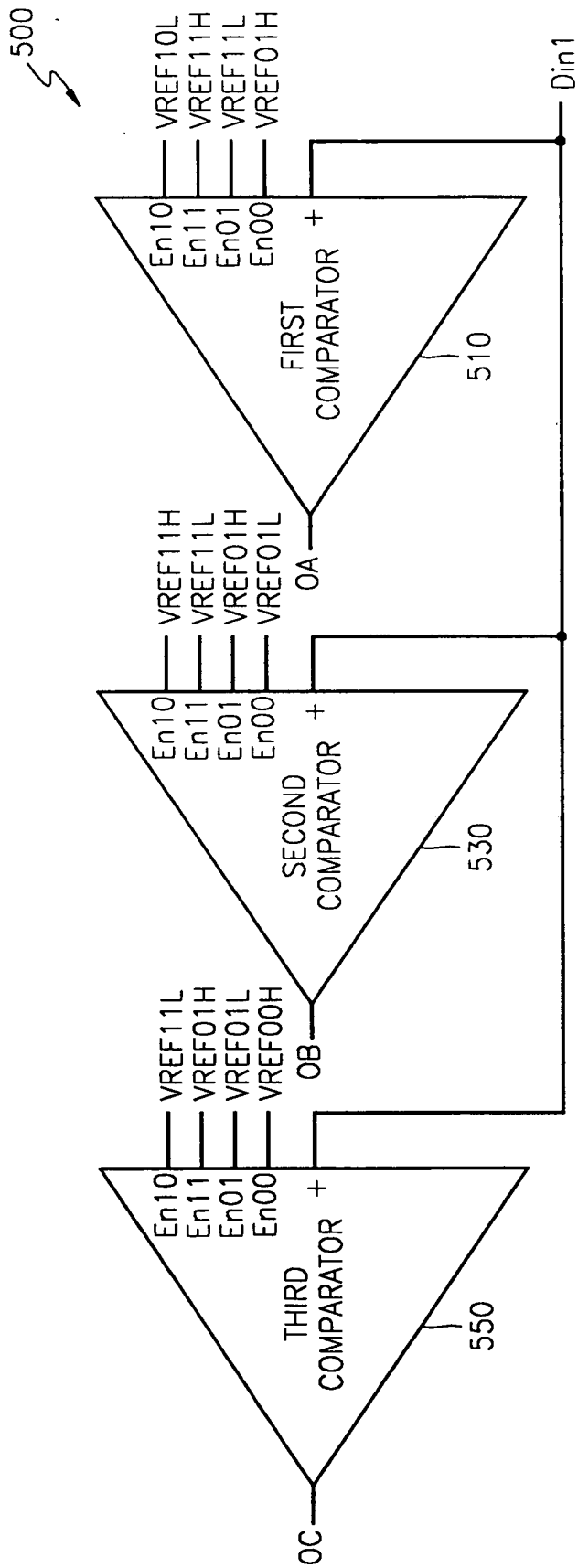

500
VREF10L
VREF11H
VREF11L
VREF01H
Din1
En10
En11
En01
En00
+
FIRST
COMPARATOR
510
VREF11H
VREF11L
VREF01H
VREF01L
OA
SECOND
COMPARATOR
530
VREF11L
VREF01H
VREF01L
VREF00H
OB
THIRD
COMPARATOR
550
OC

FIG. 17

0A	0B	0C	ED2 (=ED1)	OD2 (=OD1)
H	H	H	1	0
L	H	H	1	1
L	L	H	0	1
L	L	L	0	0